DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS CONSUMER AND INDUSTRY SERVICES

DIRECTOR'S OFFICE BUREAU OF SAFETY AND REGULATION

OCCUPATIONAL HEALTH STANDARDS COMMISSION

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These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the director of the department of licensing and regulatory affairs by sections 14 and 24 of 1974 PA 154, MCL 408.1014 and 408.1024; and Executive Reorganization Orders Nos. 1996-1, 1996-2, 2003-1, 2008-4, AND 2011-4, MCL 330.3101, 445.2001, 445.2011, 445.2025 AND 445.2030) occupational health standards commission by section 24 of act no. 154 of the public acts of 1974, as amended, being s408.1024 of the Michigan compiled laws)

R 325.51851, R 325.51852, R 325.51854, R 325.51856, R 325.51859, R 325.51860, R 325.51863, R 325.51862, R 325.51865, R 325.51866, R 325.51867, R 325.51868, R 325.51869, R 325.51873, R 325.51874, R 325.51879, R 325.51880, R 325.51881, and R 325.51883 of the Michigan Administrative Code are amended, R 325.51851a and R 325.51878a are added, and R 325.51885 and R 325.51886 are rescinded, as follows:

PART 309, CADMIUM

R 325.51851 Scope and application.

Rule 1. (1) These rules apply to all occupational exposures to cadmium and cadmium compounds in all forms and in all industries and employment situations, including the construction industry, except as provided in subrule (2) of this rule.

- (2) Some of these rules and subrules of these rules apply only to the construction industry or to general industry and agricultural operations, as indicated in the rules and subrules. If a specific application is not indicated in a rule or subrule, then the rule or subrule applies to general industry, agricultural operations, and the construction industry.
- (3) The rule replaces all references to cadmium contained in Occupational Health Standards Part 301 "Air Contaminants for General Industry" and Part 601 "Air Contaminants for Construction," as referenced in R 325.51851a. tables G-1-A and G-2 in R 325.51108 and table 2 of exhibit I of occupational health rule 6201.

R 325.51851a MIOSHA standards by reference.

Rule 1a. (1) The following Michigan occupational safety and health administration (MIOSHA) standards are referenced in these rules. Up to 5 copies of these standards may be obtained at no charge from the Michigan Department of licensing and regulatory affairs, MIOSHA standards section, 7150 Harris Drive, P.O. Box 30643, Lansing, MI, 48909-8143 or via the internet at website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, at the time of adoption of these rules, is 4 cents per page.

- (a) Administrative Part 11 "Recording and Reporting of Occupational Injuries and Illnesses," R 408.22101 to R 408.22162.
- (b) Construction Safety Standard Part 1 "General Rules," R 408.40101 to R 408.40134.
- (c) General Industry Safety Standard Part 1 "General Provisions," R 408.10001 to R 408.10098.
- (d) General Industry Safety Standard Part 33 "Personal Protective Equipment," R 408.13301 to R 408.13398.
- (e) Occupational Health Standard Part 301 "Air Contaminants for General Industry," R 325.51101 to R 325.51108.
- (f) Occupational Health Part 430 "Hazard Communication," R 325.77001 to R 325.77003.
- (g) Occupational Health Part 451 "Respiratory Protection," R 325.60051 to R 325.60052.
- (h) Occupational Health Part 470 "Employee Medical Records and Trade Secrets," R 325.3451 to R 325.3476.
- (i) Occupational Health Part 520 "Ventilation Control," R 325.52001 to R 325.52012.
- (j) Occupational Health Part 601 "Air Contaminants for Construction," R 325.60151 to R 325.60161.
- (k) Occupational Health Part 621 "Health Hazard Control for Specific Equipment and Operations for Construction," R 325.62102 to R 325.62126.
- (2) Appendices, except where portions of Appendices A, B, D, E, and F to this rule are expressly incorporated in requirements of this rule, are purely informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

R 325.51852 Definitions.

Rule 2. As used in these rules:

(a) "Action level" (AL) means an airborne concentration of cadmium of 2.5 micrograms per cubic meter of air (2.5 μ g/m3), calculated as an 8-hour, time-weighted average (TWA).

- (b) "Authorized person" means a person who is authorized by an employer, and who is required by work duties, to be present in a regulated area, or a person who is authorized under 1974 PA 154, MCL 408.1001 to 408.1094, Act No. 154 of the Public Acts of 1974, as amended, being §408.1001 et seq. of the Michigan Compiled Laws, and regulations issued under 1974 PA 154 Act 154 to be in a regulated area for the purpose of conducting an authorized investigation.
- (c) "Competent person" means a person who is designated by an employer to act on the employer's behalf, who is capable of identifying existing and potential cadmium hazards in the workplace and the proper methods to control the hazards to protect workers, and who has the authority necessary to take prompt corrective measures to eliminate or control such hazards. See R 325.51884 for the duties of a competent person.
- (d) "Construction industry" means employers whose operations involve the construction, alteration, maintenance, repair, and demolition of a facility. Construction work includes any of the following:
- (i) The wrecking, demolition, or salvage of structures where cadmium or materials that contain cadmium are present.
- (ii) The use of cadmium-containing paints and cutting, brazing, burning, grinding, or welding on surfaces that are painted with cadmium-containing paints.
- (iii) The construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof that contain cadmium or materials that contain cadmium.
- (iv) Cadmium welding or cutting of cadmium-plated steel and brazing or welding with cadmium alloys.
- (v) The installation of products that contain cadmium.
- (vi) Electrical grounding with cadmium welding and electrical work using cadmium-coated conduit.
- (vii) Maintaining or retrofitting cadmium-coated equipment.
- (viii) Cadmium contamination cleanup and emergency operations that involve cadmium.
- (ix) The transportation, disposal, storage, or containment of cadmium or materials, that contain cadmium on the site or location at which construction activities are performed.
- (e) "Director" means the director of the Michigan department of **licensing and regulatory affairs** consumer industry services or his or her designee.
- (f) "Employee exposure" means the exposure to airborne cadmium that would occur if the employee were not using respiratory protective equipment.
- (g) "Final medical determination" means the written medical opinion of the employee's health status by the examining physician under R 325.51870 to R 325.51876, **and** R 325.51877 if the review is by more than 1 physician, or R 325.51877(5) if the alternative physician determination is invoked. It is the final, written medical finding, recommendation, or determination that emerges from the medical surveillance process.
- (h) "High-efficiency particulate air (HEPA) filter" means a filter that is capable of trapping and retaining not less than 99.97% of mono-dispersed particles that are 0.3 micrometers in diameter.
- (i) "Regulated area" means an area which is demarcated by an employer and in which an employee's exposure to airborne concentrations of cadmium exceeds, or can reasonably be expected to exceed, the permissible exposure limit (PEL).

R 325.51854 Exposure monitoring generally.

Rule 4. (1) This subrule applies only to construction. Before performing ef any construction work where employees may potentially be exposed to cadmium, an employer shall establish the applicability of these rules by determining whether cadmium is present in the workplace and whether there is the possibility that employee exposures will be at or above the action level. An employer shall designate a competent person to make this determination. **The employers shall use** appropriate investigation and material testing techniques shall be used in making the determination. An investigation shall include all of the following:

- (a) A review of relevant plans.
- (b) A review of past reports relative to cadmium.
- (c) Material Safety data sheets.
- (d) Other available records.
- (e) Consultations with the property owner.
- (f) Discussions with appropriate individuals and agencies.
- (2) An employer whose workplace or work operation involves cadmium in any way shall determine if any employee may be exposed to cadmium at or above the action level. An employer shall identify which employees potentially are exposed to cadmium at or above the action level and shall conduct exposure monitoring to determine what the exposure levels are.
- (3) Determinations of employee exposure shall be made from breathing zone air samples that reflect the monitored employee's regular, daily 8-hour TWA exposure to cadmium.
- (4) Eight-hour TWA exposures shall be determined for each employee on the basis of 1 or more personal breathing zone air samples that reflect a full shift of exposure on each shift, for each job classification, in each work area. Where several employees perform the same job tasks, in the same job classification, on the same shift, and in the same work area and the length, duration, and level of cadmium exposures are similar, an employer may sample a representative fraction of the employees instead of all of the employees to meet this requirement. In representative sampling, an employer shall sample the employee who is expected to have the highest cadmium exposures.

(5) An employer shall use a method of monitoring and analysis that has an accuracy of not less than plus or minus 25%, with a confidence level of 95%, for airborne concentrations of cadmium at or above the action level, the permissible exposure limit (PEL), and the separate engineering control air limit (SECAL).

R 325.51856 Employee notification of monitoring results.

- Rule 6. (1) Not later than 15 working days for general industry and agricultural operations and not later than 5 working days for the construction industry, after an employer receives the results of any exposure monitoring that is performed pursuant to the provisions of these rules, an employer shall notify each affected employee individually in writing, **or by posting** of the results, In addition, within the same time period, an employer shall post the results of the exposure monitoring in an appropriate location that is accessible to all affected employees.
- (2) If monitoring results indicate that employee exposure exceeds the PEL, then an employer shall include, in the written notice, a statement that the PEL has been exceeded and a description of the corrective action that is being taken by the employer to reduce employee exposure to or below the PEL.

R 325.51859 Engineering and work practice controls; applicability of rule to construction industry.

- Rule 9. (1) This rule applies only to the construction industry. Except as specified in subrule (2) of this rule, an employer shall implement engineering and work practice controls to reduce and maintain employee exposure to cadmium at or below the PEL, unless, and to the extent that, the employer can demonstrate that the controls are not feasible.
- (2) The requirement to implement engineering controls to achieve the PEL does not apply if an employer can demonstrate both of the following:
- (a) The employee is only intermittently exposed.
- (b) The employee is not exposed above the PEL on 30 or more days per 12-consecutive-month period.
- (3) If engineering and work practice controls are not sufficient to reduce employee exposure at or below the PEL, an employer nonetheless shall implement the controls to reduce exposures to the lowest levels achievable. The employer shall supplement the controls with respiratory protection that is in compliance with the provisions of R 325.51862 and the PEI
- (4) An employer shall not use employee rotation as a method of compliance.
- (5) All of the following provisions apply to the specific operations indicated:
- (a) Abrasive blasting of cadmium or cadmium-containing materials shall be conducted in a manner that will provide adequate protection for employees.
- (b) Welding, cutting, and other forms of heating cadmium or cadmium-containing materials shall be conducted in accordance with the requirements of Occupational Health Standard Part 621 "Health Hazard Control for Specific Equipment and Operations for Construction," as referenced in R 325.51851a, rule 6310(3) and (4), where applicable.
- (c) High-speed abrasive disc saws and similar abrasive power equipment that **are** is used for work on cadmium or cadmium-containing materials shall be equipped with appropriate engineering controls to minimize emissions to levels below the PEL.
- (d) Materials that contain cadmium shall not be applied by spray methods if resulting exposures are above the PEL, unless employees are protected with supplied-air respirators which have full facepieces, hoods, helmets, and suits and which are operated in a positive pressure mode and, in addition, measures are instituted to limit overspray to prevent contamination of adjacent areas.

R 325.51860 Use of mechanical ventilation to control exposure to cadmium.

- Rule 10. (1) If ventilation is used to control cadmium exposure, measurements that demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure, shall be made as necessary to ensure the ventilation system's effectiveness.
- (2) Measurements of the system's effectiveness in controlling exposure shall be made as necessary within 5 working days of any change in production, process, or control that might result in a significant increase in employee exposure to cadmium.
- (3) If air from exhaust ventilation is recirculated into the workplace, the system shall have a high-efficiency filter and be monitored to ensure effectiveness. Recirculation of local exhaust air shall be in compliance with the provisions of Occupational Health Standard Part 520 "Ventilation Control," as referenced in R 325.51851a. rule 3101(10).
- (4) Procedures shall be developed and implemented to minimize employee exposure to cadmium when maintenance is performed on the ventilation systems and when filters are changed.

R 325.51862 Respiratory protection; circumstances for use; selection.

- Rule 12. (1) For employees who use respirators required by this rule, the employer shall provide **each employee an appropriate** respirator that **complies** comply with the requirements of this rule. Respirators must be used during all of the following:
- (a) Periods necessary to install or implement feasible engineering and work practice controls when employee exposures exceeds the PEL.
- (b) Maintenance and repair activities and brief or intermittent work operations for which employee exposures exceed the PEL and engineering and work practice controls are not feasible or are not required.

- (c) Work operations in the regulated areas specified in R 325.51857.
- (d) Work operations for which the employer has implemented all feasible engineering and work practice controls and such controls are not sufficient to reduce exposures to or below the PEL.
- (e) Emergencies.
- (f) Work operations for which an employee who is exposed to cadmium at or above the action level requests a respirator.
- (g) Work operations for which engineering controls are not required by R 325.51859(2) to reduce employee exposures that exceed the PEL.
- (2) The employer shall do all of the following: select the appropriate respirator from table 2.
- (a) Select, and provide to employees, the appropriate respirators specified in paragraph (d)(3)(i)(A) of Occupational Health Standard Part 451 "Respiratory Protection," as referenced in R 325.51851a.
- (b) Provide employees with full facepiece respirators when they experience eye irritation.
- (c) Provide HEPA filters for powered and non-powered air-purifying respirators.
- (3) Table 2 reads as follows:

Table 2 RESPIRATORY PROTECTION FOR CADMIUM	
Airborne Concentration ^a or Condition of use	Required Respirator Type ^b
10 times or less	A half-mask, air-purifying respirator equipped with a HEPA filter. (d)
25 times or less	A powered air-purifying respirator (PAPR) with a loose-fitting hood or helmet equipped with a HEPA filter, or a supplied-air respirator with a loose-fitting hood or helmet facepiece operated in the continuous flow mode
50 times or less	A full facepiece air-purifying respirator equipped with a HEPA filter, or a powered air-purifying respirator with a tight-fitting half-mask equipped with a HEPA filter, or a supplied-air respirator with a tight-fitting half-mask operated in the continuous flow mode.
250 times or less	A powered air-purifying respirator with tight-fitting full facepiece equipped with a HEPA filter, or supplied-air respirator with a tight-fitting full facepiece operated in the continuous flow mode
1,000 times or less	A supplied-air respirator with a half-mask or full facepiece operated in the pressure demand or other positive pressure mode.
More than 1,000, times or unknown concentrations	A self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode; or a supplied-air respirator with a full facepiece operated in the pressure demand or other positive pressure mode and equipped with an auxiliary escape-type self-contained breathing apparatus operated in the pressure demand mode.
Fire fighting	A self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode.
* Concentrations expressed as multiple of the PEL	
*Respirators assigned for higher environmental concentrations may be used at lower exposure levels. Quantitative fit testing is required for all tight-fitting air-purifying respirators	
where the airborne concentration of cadmium is more than 10 times the TWA PEL (10 x 5	
$\mu g/m3 = 50 \mu g/m^3$). A full facepiece respirator is required when eye irritation is experienced.	
⁶ -HEPA means High Efficiency Particulate Air.	
^d -Fit testing, qualitative or quantitative, is required	

(3)(4) An employer shall provide a powered, air-purifying respirator (PAPR) in place of a negative pressure respirator if an employee who is entitled to a respirator chooses to use this type of respirator and if a PAPR respirator will provide adequate protection to the employee.

R 325.51863 Respiratory protection program; fit testing.

Rule 13. (1) The employer shall implement a

respiratory protection program in accordance with Occupational Health Standard Part 451 "Respiratory Protection," 29 C.F.R. § Rules 1910.134(b) to (d) and (f) to (m), except for (d)(1)(iii), as referenced in R 325.51851a, which covers each employee required by this rule to use a respirator.

- (2) If an employee exhibits breathing difficulty during fit testing or respirator use, then the employer shall provide the employee with a medical examination under R 325.51868(2)(d) to determine if the employee can use a respirator while performing the required duties.
- (3) An employee shall not use a respirator when, based on his or her most recent medical examination, the examining physician determines that the employee will be unable to continue to function normally while using a respirator. If the physician determines the employee must be limited in, or removed from, the employee's current job because of the employee's inability to use a respirator, then the employer shall conduct the job limitation or removal under R 325.51875 and R 325.51876.

R 325.51865 Protective work clothing and equipment.

- Rule 15. (1) If an employee is exposed to airborne cadmium above the PEL or if skin or eye irritation is associated with cadmium exposure at any level, then an employer shall provide, at no cost to the employee, and ensure that the employee uses, appropriate protective work clothing and equipment that prevents contamination of the employee and the employee's garments. Protective work clothing and equipment includes all of the following:
- (a) Coveralls or similar full-body work clothing.
- (b) Gloves, head coverings, and boots or foot coverings.
- (c) Face shields, vented goggles, or other appropriate protective equipment that is in compliance with the provisions of General Industry Standard Part 33 "Personal Protective Equipment," as referenced in R 325.51851a. R 408.13301 et seq. of the Michigan Administrative Code
- (2) All of the following provisions pertain to the removal and storage of protective work clothing and equipment:
- (a) An employer shall ensure that employees remove all protective clothing and equipment that is contaminated with cadmium at the completion of the work shift and that employees do so only in change rooms that are provided in accordance with the provisions of R 325.51866(2).
- (b) An employer shall ensure that an employee does not take cadmium-contaminated protective clothing or equipment from the workplace, except for employees who are authorized to do so for purposes of laundering, cleaning, maintaining, or disposing of cadmium-contaminated protective clothing and equipment at an appropriate location or facility away from the workplace.
- (c) An employer shall ensure that contaminated protective clothing and equipment, when removed for laundering, cleaning, maintenance, or disposal, is placed and stored in sealed, impermeable bags or other closed, impermeable containers that are designed to prevent the dispersion of cadmium dust.
- (d) An employer shall assure that bags or containers of contaminated protective clothing and equipment that are to be taken out of the change rooms or the workplace for laundering, cleaning, maintenance, or disposal bear labels in accordance with the previsions of R 325.51879. (3).
- (3) All of the following provisions pertain to the cleaning, replacement, and disposal of protective clothing and equipment:
- (a) An employer shall provide the protective clothing and equipment required by subrule (1) of this rule in a clean and dry condition as often as necessary to maintain its effectiveness, but at least weekly. An employer is responsible for cleaning and laundering the protective clothing and equipment required by this rule to maintain its effectiveness and is also responsible for disposing of the clothing and equipment.
- (b) An employer is responsible for repairing or replacing required protective clothing and equipment as needed to maintain its effectiveness. An employer shall ensure that rips or tears, which are detected while an employee is working are immediately mended or the worksuit shall be immediately replaced.
- (c) An employer shall prohibit the removal of cadmium from protective clothing and equipment by blowing, shaking, or any other means that disperses cadmium into the air.
- (d) An employer shall ensure that any laundering of contaminated clothing or cleaning of contaminated equipment in the workplace is done in a manner that prevents the release of airborne cadmium in excess of the PEL.
- (e) An employer shall inform any person who launders or cleans protective clothing or equipment contaminated with cadmium of the potentially harmful effects of exposure to cadmium and that the clothing and equipment should be laundered or cleaned in a manner to effectively prevent the release of airborne cadmium in excess of the PEL.

R 325.51866 Hygiene areas and practices.

Rule 16. (1) An employer shall provide clean change rooms, handwashing facilities, showers, and lunchroom facilities that are in compliance with the provisions of occupational health rule 4201 for General Industry **Standard Part 1**

"General Provisions," or occupational health rule 6615 for the Construction Safety Standard Part 1 "General Rules," as referenced in R 325.51851a, industry for employees whose airborne exposure to cadmium is above the PEL.

- (2) An employer shall ensure that change rooms are equipped with separate storage facilities for street clothes and for protective clothing and equipment which are designed to prevent the dispersion of cadmium and contamination of the employee's street clothes.
- (3) Both of the following provisions pertain to showers and handwashing facilities:
- (a) An employer shall ensure that employees who are exposed to cadmium above the PEL shower during the end of the work shift.
- (b) An employer shall ensure that employees whose airborne exposure to cadmium is above the PEL wash their hands and faces before eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics.
- (4) Both of the following provisions pertain to lunchroom facilities:
- (a) An employer shall ensure that lunchroom facilities are readily accessible to employees, that tables for eating are maintained free of cadmium, and that no employee in a lunchroom facility is exposed at any time to cadmium at or above a concentration of 2.5 µg/m3.
- (b) An employer shall ensure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface cadmium has been removed from the clothing and equipment by HEPA filter vacuuming or some other method that removes cadmium dust without dispersing it.

R 325.51867 Housekeeping.

Rule 17. An employer shall comply with all of the appropriate following requirements pertaining to housekeeping:

- (a) All surfaces shall be maintained as free as practical of the accumulation of cadmium.
- (b) All spills and sudden releases of material that contains cadmium shall be cleaned up as soon as possible.
- (c) Surfaces that are contaminated with cadmium shall, where possible, be cleaned by vacuuming or other method that minimizes the likelihood of cadmium becoming airborne.
- (d) HEPA filter vacuuming equipment or equally effective filtration methods shall be used for vacuuming. The equipment shall be used and emptied in a manner that minimizes the reentry of cadmium into the workplace.
- (e) Shoveling or dry or wet sweeping and brushing may be used only if vacuuming or other methods that minimize the likelihood of cadmium becoming airborne have been tried and found to be ineffective.
- (f) Compressed air shall not be used to remove cadmium from any surface unless the compressed air is used in conjunction with a ventilation system that is designed to capture the dust cloud created by the compressed air.
- (g) Waste scrap, debris, bags, containers, personal protective equipment, and clothing which **are** is contaminated with cadmium and which **are** is consigned for disposal shall be collected and disposed of in sealed impermeable bags or other closed, impermeable containers. The bags and containers shall be labeled in accordance with the provisions of R 325.51878a and R 325.51879. (3).

R 325.51868 Medical surveillance generally; applicability of subrules (1) and (2)

- Rule 18. (1) This subrule applies only to general industry and agricultural operations. An employer shall institute a medical surveillance program as follows:
- (a) For all employees who are or may be exposed to cadmium at or above the action level, unless the employer can demonstrate that the employee is not, and will not be, exposed at or above the action level on 30 or more days during a 12-consecutive-month period.
- (b) For all employees who, before **September 16, 1993**, the effective date of these rules, might previously have been exposed to cadmium at or above the action level by the employer, unless the employer can demonstrate that the employee, before **September 16, 1993**, the effective date of these rules, did not work for the employer in jobs with exposure to cadmium for an aggregated total of more than 60 months.
- (c) To determine an employee's fitness for wearing a respirator, an employer shall provide the limited medical examination specified by R 325.51873(1) and (2).
- (2) This subrule applies only to the construction industry. An employer shall institute a medical surveillance program as follows:
- (a) For all employees who are or may be exposed at or above the action level.
- (b) For all employees who perform any of the following tasks, operations, or jobs:
- (i) Electrical grounding with cadmium welding.
- (ii) Cutting, brazing, burning, grinding, or welding on surfaces that are painted with cadmium containing paints.
- (iii) Electrical work using cadmium-coated conduit.
- (iv) Use of cadmium-containing paints.
- (v) Cutting and welding cadmium-plated steel.
- (vi) Brazing or welding with cadmium alloys.
- (vii) Fusing of reinforced steel by cadmium welding.
- (viii) Maintaining or retrofitting cadmium-coated equipment.
- (ix) Wrecking and demolition where cadmium is present.
- (c) For all employees who previously might have been exposed to cadmium by the employer before **September 16**, **1993**, the effective date of these rules in tasks listed in subdivision (b) of this subrule, unless the employer can

demonstrate that the employee, in the years before **September 16, 1993**, the effective date of these rules, did not work in those tasks for the employer with exposure to cadmium for an aggregated total of more than 12 months.

- (d) To determine an employee's fitness for wearing a respirator, an employer shall provide the limited medical examination specified by R 325.51873(1) and (2).
- (e) A medical surveillance program is not required if an employer can demonstrate that both of the following provisions apply:
- (i) An employee is not currently exposed by the employer to airborne concentrations of cadmium at or above the action level on 30 or more days during a 12-consecutive-month period.
- (ii) An employee is not currently exposed by the employer in those tasks listed in subdivision (b) of this subrule on 30 or more days during a 12-consecutive-month period.
- (3) An employer shall ensure that all medical examinations and procedures that are required by these rules are performed by or under the supervision of a licensed physician who has read, and is familiar with, all of the following:
- (a) The health effects section of appendix A.
- (b) The regulatory text of these rules.
- (c) The protocol for sample handling and laboratory selection in appendix F.
- (d) The questionnaire in appendix D. All medical surveillance, examinations, tests, and procedures shall be provided without cost to the employee and at a time and place that is reasonable and convenient for employees.
- (4) An employer shall ensure that the collection and handling of biological samples of cadmium in urine (CdU), cadmium in blood (CdB), and beta-2 microglobulin in urine (Ω_2 -M) taken from employees is done in a manner that ensures the integrity and reliability of the samples and that analysis of the samples is performed in laboratories that have a demonstrated proficiency for the particular analyte. See appendix F.

R 325.51869 Initial medical examination.

Rule 19. (1) An employer shall provide an initial medical examination to all employees who are covered by the medical surveillance program required pursuant to the provisions of R 325.51868(1) or (2). The examination shall be provided to covered employees within 30 days after initial assignment to a job with exposure to cadmium or not later than 90 days after **September 16, 1993**, the effective date of these rules, whichever date is later.

- (2) The initial medical examination shall include both of the following elements:
- (a) A detailed medical and work history, with an emphasis on all of the following:
- (i) Past, present, and anticipated future exposure to cadmium.
- (ii) Any history of renal, cardiovascular, respiratory, hematopoietic, reproductive, or musculoskeletal system dysfunction.
- (iii) Current use of medication that has potential nephrotoxic side effects.
- (iv) Smoking history and current status.
- (b) Biological monitoring that includes all of the following tests:
- (i) Cadmium in urine (CdU), standardized to grams of creatinine (g Cr).
- (ii) Beta-2 microglobulin in urine (B2-M), standardized to grams of creatinine (g Cr) with Ph specified, as described in appendix F.
- (iii) Cadmium in blood (CdB), standardized to liters of whole blood (lwb).
- (3) An initial medical examination is not required to be provided if adequate records show that an employee has been examined in accordance with the requirements of subrule (2) of this rule within the past 12 months. If an employee has been examined in accordance with the requirements of subrule (2) of this rule within the past 12 months, the records shall be maintained as part of the employee's medical record and the exam shall be treated as if it were an initial medical examination for the purposes of R 325.51870 and R 325.51871.

R 325.51873 Medical exams for fitness to use respirators, for exposure due to emergency, and at termination.

Rule 23. (1) To determine an employee's fitness for respirator use, an employer shall provide a medical examination that includes the elements specified in this subrule. The examination shall be provided before an employee is assigned to a job that requires the use of a respirator or not more than 90 days after **September 16, 1993**, these rules take effect, whichever date is later, to any employee who has not had a medical examination within the preceding 12 months that satisfies the requirements of this subrule. The medical exam shall include all of the following:

- (a) A detailed medical and work history, or update thereof, with an emphasis on all of the following:
- (i) Past exposure to cadmium.
- (ii) Smoking history and current status.
- (iii) Any history of renal, cardiovascular, respiratory, hematopoietic, or musculo-skeletal system dysfunction.
- (iv) A description of the job for which the respirator is required.
- (v) Answers to questions 3-11 and 25-32 in appendix D to these rules.
- (b) A blood pressure test.
- (c) Biological monitoring of the employee's levels of CdU, CdB, and ß2-M in accordance with the requirements of R 325.51869(2)(b), unless the results have been obtained within the previous 12 months.
- (d) Any other test or procedure that the examining physician deems appropriate.
- (2) All of the following provisions pertain to the medical examination for respirator use:

- (a) After reviewing all of the information obtained from the medical examination required in subrule (1) of this rule, the physician shall determine whether the employee is fit to wear a respirator.
- (b) If an employee has exhibited difficulty in breathing during a respirator fit test or during use of a respirator, an employer shall provide the employee, as soon as possible, with a periodic medical examination in accordance with the provisions of R 325.51871(2) to determine the employee's fitness to wear a respirator.
- (c) If the results of the examination required by subrule (1) of this rule or subdivision (a) or (b) of this subrule are abnormal, the medical limitation or prohibition of respirator use shall be considered. If the employee is allowed to wear a respirator, the employee's ability to continue to do so shall be periodically evaluated by a physician.
- (3) In addition to the medical surveillance required by the provisions of R 325.51869 to R 325.51873(2), an employer shall provide a medical examination, as soon as possible, to any employee who may have been acutely exposed to cadmium because of an emergency. The examination shall include the information required pursuant to the provisions of R 325.51871(2), with an emphasis on the respiratory system, other organ systems considered appropriate by the examining physician, and symptoms of acute overexposure, as reviewed in appendix A to these rules.
- (4) At termination of employment, an employer shall provide a medical examination in accordance with the provisions of R 325.51871(2), including a chest X ray where necessary, to any employee to whom, at any prior time, an employer was required to provide medical surveillance pursuant to the provisions of R 325.51868(1) or subrule (3) of this rule. However, if the last examination satisfied the requirements of R 325.51871(2) and was less than 6 months before the date of termination, then another examination is not required unless otherwise specified by the provisions of R 325.51872(1) or (2). If the employer has discontinued all periodic medical surveillance as provided by the provisions of R 325.51871(4), the termination of employment medical examination is not required.

R 325.51874 **Providing** Provision of information to physician by employer; employer required to obtain medical opinion; employer required to obtain results of biological monitoring; findings unrelated to cadmium exposure.

Rule 24. (1) An employer shall provide all of the following information to an examining physician:

- (a) A copy of these rules and appendices.
- (b) A description of an affected employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to cadmium.
- (c) An employee's former, current, and anticipated future levels of occupational exposure to cadmium.
- (d) A description of any personal protective equipment, including respirators, that were used or are to be used by the employee, including the date of use and the length of time that the employee has used that equipment.
- (e) The results of previous biological monitoring and medical examinations that are relevant to the employee.
- (2) An employer shall promptly obtain a written signed medical opinion from the examining physician for each medical examination performed on each employee. The written opinion shall contain all of the following information:
- (a) The physician's diagnosis for the employee.
- (b) The physician's opinion as to whether the employee has any detected medical condition that would place the employee at an increased risk of material impairment to health from further exposure to cadmium, including any indications of potential cadmium toxicity.
- (c) The results of any biological or other testing or related evaluations that directly assess the employee's absorption of cadmium.
- (d) Any recommended removal from, or limitation on, the activities or duties of the employee or on the employee's use of personal protective equipment including respirators.
- (e) A statement that the physician has clearly and carefully explained to the employee the results of the medical examination, including all biological monitoring results and any medical conditions related to cadmium exposure that require further evaluation or treatment, and any limitation on the employee's diet or use of medications.
- (3) An employer promptly shall obtain a copy of the results of any biological monitoring that is provided to an employee by requirements other than those of a medical examination required by the provisions of R 325.51869 and R 325.51871 and, if there is no written medical opinion, shall obtain an explanation sheet explaining the results.
- (4) An employer shall instruct the physician not to reveal orally or in the written medical opinion that is given to the employer specific findings or diagnoses unrelated to an occupational exposure to cadmium.

R 325.51878a Hazard communication--general.

Rule 28a. (1) Chemical manufacturers, importers, distributors and employers shall comply with all requirements of the Occupational Health Standard Part 430 "Hazard Communication," as referenced in R 325.51851a, for cadmium.

- (2) In classifying the hazards of cadmium, at least the following hazards are to be addressed:
- (a) Cancer.
- (b) Lung effects.
- (c) Kidney effects.
- (d) Acute toxicity effects.
- (3) Employers shall include cadmium in the hazard communication program established to comply with the requirements of the Occupational Health Standard Part 430 "Hazard Communication." Employers shall ensure that each employee has access to labels on containers of cadmium and to safety data sheets, and is trained in

accordance with R 325.51880 and Occupational Health Standard Part 430 "Hazard Communication," as referenced in R 325.51851a.

R 325.51879 Communication of cadmium hazards to employees.

Rule 29. (1) In communications to employees concerning cadmium hazards, an employer shall comply with the requirements of the occupational safety and health administration (OSHA) hazard communication standard, being 29 C.F.R. §1910.1200, which is incorporated by section 14a of Act No. 154 of the Public Acts of 1974, as amended, being §408.1014a of the Michigan Compiled Laws. In addition to section 14a of Act No. 154 of the Public Acts of 1974, as amended, an employer shall comply with, the requirements of the amended Occupational safety and Health administration (OSHA) "Hazard Communication," standards for general industry or the construction industry, being 29 C.F.R. §1910.1200 and 29 C.F.R. §1926.59, which were adopted by reference in R 325.77001 et seq. of the Michigan Administrative Code. The hazard communication requirements include labels, material safety data sheets (MSDS), and employee information and training.

(1)(2) An employer shall provide warning signs shall be provided and displayed them in regulated areas. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take the necessary protective steps before entering the regulated area. Beth of the following provisions pertain to warning signs:

(2) Warning signs required by subrule (1) of this rule, shall bear the following legend:

DANGER
CADMIUM
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS AND KIDNEYS
WEAR RESPIRATORY PROTECTION IN THIS AREA
AUTHORIZED PERSONNEL ONLY

- (3) Prior to June 1, 2016, employers may use the following legend in lieu of that specified in subrule (2) of this rule.
- -(a) Warning signs shall bear the following legend:

DANGER
CADMIUM
CANCER HAZARD
CAN CAUSE LUNG AND KIDNEY DISEASE
AUTHORIZED PERSONNEL ONLY
RESPIRATORS REQUIRED IN THIS AREA

- (4)(b) An employer shall ensure that warning signs that are required by this subrule are illuminated, cleaned, and maintained as necessary so that the legend is readily visible.
- (5)(3) An employer shall comply with the labeling requirements of 29 C.F.R. §1910.1200 and 29 C.F.R.§1926.59 and shall ensure that all shipping and storage containers that contain cadmium, or cadmium compounds, or cadmium contaminated clothing, equipment, waste, scrap, or debris shall bear appropriate warning labels as specified in R 408.51878a. At a minimum, a warning label shall include all of the following information:
- (6) The warning labels for containers of cadmium-contaminated protective clothing, equipment, waste, scrap, or debris shall include at least the following information:

DANGER
CONTAINS CADMIUM
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS AND KIDNEYS
AVOID CREATING DUST

(7) Prior to June 1, 2015, employers may include the following information on shipping and storage containers containing cadmium, cadmium compounds, or cadmium contaminated clothing, equipment, waste, scrap, or debris in lieu of the labeling requirements specified in R 408.51878a and subrule (2) of this rule:

DANGER
CONTAINS CADMIUM
CANCER HAZARD
AVOID CREATING DUST
CAN CAUSE LUNG AND KIDNEY DISEASE

(8) Also, Where feasible, installed cadmium products shall have a visible label or other indication that cadmium is present.

R 325.51880 Employee information and training. applicability of subrule (4).

- Rule 30. (1) An employer shall train each employee who is potentially exposed to cadmium in accordance with this rule. The employer shall institute a training program, for all employees who may be exposed to cadmium, assure ensure employee participation in the program, and maintain a record of the contents of the program. Employee training shall be provided before or at the time of initial assignment to a job that involves potential exposure to cadmium and at least annually thereafter.
- (2) An employer shall make the training program understandable to the employee and shall ensure that each employee is informed of all of the following:
- (a) The health hazards associated with cadmium exposure, with special attention to the type of information provided in appendix A.
- (b) The quantity, location, manner of use, release, and storage of cadmium in the workplace and the specific nature of operations that could result in exposure to cadmium, especially exposure above the PEL.
- (c) The engineering controls and work practices associated with the employee's job assignment.
- (d) The measures employees can take to protect themselves from exposure to cadmium, including modification of smoking and personal hygiene habits, and the specific procedures the employer has implemented to protect employees from exposure to cadmium, such as appropriate work practices, emergency procedures, and the provision of personal protective equipment.
- (e) The purpose, proper selection, fitting, proper use, and limitations of respirators and protective clothing.
- (f) The purpose and a description of the medical surveillance program required pursuant to the provisions of R 325.51868 to R 325.51878.
- (g) The contents of these rules and the appendices to these rules.
- (h) The employee's right of access to records as provided by the provisions of Occupational Health Standard Part 470 "Employee Medical Records and Trade Secrets," as referenced in R 325.51851a. R 325.3460 to R 325.3471 and R 325.3473.
- (3) An employer shall make a copy of these rules and the appendices to these rules readily available without cost to all affected employees and shall provide a copy if requested. Also, an employer shall provide to the director, upon request, all materials relating to the employee information and training program.
- (4) This subrule applies only to the construction industry. In a multiemployer workplace, an employer who produces, uses, or stores cadmium in a manner that may expose employees of other employers to cadmium shall notify the other employers of the potential hazards in accordance with the provisions of Occupational Health Standard Part 430 "Hazard Communication," for general industry or the construction industry, as referenced in R 325.51851a. 29 C.F.R. §1926.59(4)(2)(i)-(iii), which is referenced in R 325.51879(1).

R 325.51881 Recordkeeping.

Rule 31. (1) All of the following provisions pertain to records of exposure monitoring:

- (a) An employer shall establish and keep accurate records of all air monitoring for cadmium in the workplace.
- (b) Air monitoring records shall include, at a minimum, all of the following information:
- (i) The monitoring date, shift, duration, and results in terms of an 8-hour TWA of each sample taken and, if cadmium is not detected, the detection level.
- (ii) The name, social security number, and job classification of all employees who are monitored and of all other employees whose exposures the monitoring result is intended to represent, including, if applicable, a description of the justification that monitoring results of 1 employee can represent other employees' exposures.
 - (iii) A description of the sampling and analytical methods used and evidence of their accuracy.
- (iv) The type of respiratory protective device, if any, worn by the monitored employee and by any other employee whose exposure the monitoring result is intended to represent.
- (v) A notation of any other conditions that might have affected the monitoring results.
- (vi) Any exposure monitoring or objective data that were used and the exposure levels obtained. The provisions of this paragraph apply only to the construction industry.
- (c) An employer shall maintain these records for not less than 30 years as set in accordance with the provisions of Occupational Health Standard Part 470 "Employee Medical Records and Trade Secrets," as referenced in R 325.51851a. R 325.3457.
- (d) This subdivision applies only to the construction industry. An employer shall provide a copy of the results of an employee's air monitoring prescribed in R 325.51854 and R 325.51855 to an industry trade association and to the employee's union, if any. If neither the association nor the union exists, monitoring results shall be furnished to another comparable organization which is competent to maintain such records and which is reasonably accessible to employers and employees in the industry.
- (2) This subrule applies to objective data used to exempt an employer from the requirements to perform initial monitoring as provided in R 325.51855(3). For the purposes of these rules, "objective data" means information which demonstrates that a particular product or material that contains cadmium, or a specific process, operation, or activity that involves

cadmium, cannot release dust or fumes in concentrations at or above the action level even under the worst-case release conditions. Objective data can be obtained from an industry-wide study or from laboratory product testing results for manufacturers of cadmium containing products or materials. The data the employer uses from an industry-wide survey shall be obtained under workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations. An employer shall establish and maintain a record of the objective data for not less than 30 years.

- (3) All of the following provisions pertain to medical surveillance records:
- (a) An employer shall establish and maintain an accurate record for each employee covered by the medical surveillance requirements of R 325.51868(1) or (2).
- (b) The medical surveillance records shall include, at a minimum, all of the following information about the employee:
- (i) Name, social security number, and description of duties.
- (ii) A copy of the physician's written opinions and an explanation sheet for biological monitoring results.
- (iii) A copy of the medical history, the results of any physical examination, and all test results that are required to be provided by these rules, including biological tests, X-rays, pulmonary function tests, and tests that have been obtained to further evaluate any condition that might be related to cadmium exposure.
- (iv) The employee's medical symptoms that might be related to exposure to cadmium.
- (v) A copy of the information that is provided to the physician as required by the provisions of R 325.51874(1)(b) to (e).
- (c) An employer shall ensure that medical records are maintained for the duration of employment plus 30 years as specified by the provisions of Occupational Health Standard Part 470 "Employee Medical Records and Trade Secrets," as referenced in R 325.51851a. R 325.3456.
- (4) With regard to training records, an employer shall certify that employees have been trained by preparing a certification record that includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification record shall be prepared at the completion of training and shall be maintained on file for 1 year beyond the date of training of that employee.
- (4)(5) All of the following provisions pertain to the availability and transfer of records:
- (a) Except as otherwise provided for in these rules, access to all records that are required to be maintained by this rule shall be in compliance with the previsions of Occupational Health Standard Part 470 "Employee Medical Records and Trade Secrets," as referenced in R 325.51851a. R 325.3451 et seq.
- (b) Within 15 days after a request, an employer shall make an employee's medical records that are required to be kept pursuant to the provisions of subrule (3) of this rule available for examination and copying to the subject employee, to a designated representative, or to anyone who has the specific written consent of the subject employee and, after the employee's death or incapacitation, to the employee's family members.
- (c) When an employer ceases to do business and there is no successor employer to receive and retain records for the prescribed period or the employer intends to dispose of any records that are required to be preserved for not less than 30 years, then the employer shall comply with the requirements concerning the transfer of records set forth in **Occupational Health Standard Part 470** "Employee Medical Records and Trade Secrets," as referenced in R 325.51851a. R 325.3475.
- (5)(6) An employer shall ensure that any abnormal condition or disorder that is caused by occupational exposure to cadmium in the workplace is properly recorded in injury and illness records pursuant to the provisions of Administrative Standard Part 11 "Recording and Reporting of Occupational Injuries and Illnesses," as referenced in R 325.51851a. R 408.22101 et seq.

R 325.51883. Compliance dates.

- Rule 33. (1) All of the requirements of these **The** rules that apply to general industry and agricultural operations shall commence on **September 16**, **1993**, the effective date of these rules, except as follows:
- (a) Except for small businesses that have 19 or fewer employees, initial monitoring that is required by the provisions of R 325.51855 shall be completed as soon as possible, but not later than 60 days after **September 16, 1993.** the effective date of these rules. For small businesses, initial monitoring shall be completed as soon as possible, but not later than 120 days after **September 16, 1993.** the effective date of these rules.
- (b) Except for small businesses that have 19 or fewer employees, regulated areas that are required by the provisions of R 325.51857 shall be established as soon as possible after the results of exposure monitoring are known, but not later than 90 days after **September 16, 1993.** the effective date of these rules. For small businesses, required regulated areas shall be established as soon as possible after the results of exposure monitoring are known, but not later than **September 16, 1993.** 150 days after the effective date of these rules.
- (c) Except for small businesses that have 19 or fewer employees, respiratory protection that is required by the provisions of R 325.51862 and R 325.51863 shall be provided as soon as possible, but not later than 90 days after **September 16**, **1993.** the effective date of these rules. For small businesses, respiratory protection shall be provided as soon as possible, but not later than 150 days after **September 16**, **1993.** the effective date of these rules.
- (d) Written compliance programs that are required by the provisions of R 325.51858(7) shall be completed and available for inspection and copying as soon as possible, but not later than 1 year after **September 16, 1993.** the effective date of these rules.

- (e) The engineering controls that are required by the provisions of R 325.51858(1) to (6) shall be implemented as soon as possible, but not later than 2 years after **September 16, 1993**. the effective date of these rules. Work practice controls shall be implemented as soon as possible. Work practice controls that are directly related to engineering controls to be implemented in accordance with the compliance plan shall be implemented as soon as possible after the engineering controls are implemented.
- (f) Permanent or temporary hand-washing facilities shall be provided as soon as possible, but not later than 60 days after **September 16, 1993.** the effective date of these rules.
- (g) Change rooms, showers, and lunchroom facilities shall be provided as soon as possible, but not later than 1 year after **September 16, 1993.** the effective date of these rules.
- (h) Except for small businesses that have 19 or fewer employees, the employee information and training that is required by the provisions of R 325.51880 shall be provided as soon as possible, but not later than 90 days after **September 16**, **1993.** the effective date of these rules. For small businesses, employee information and training shall be provided as soon as possible, but not later than 180 days after **September 16**, **1993.** the effective date of these rules.
- (i) Except for small businesses that have 19 or fewer employees, initial medical examinations that are required by the provisions of R 325.51869 shall be provided as soon as possible, but not later than 90 days after **September 16, 1993.** the effective date of these rules. For small businesses, initial medical examinations shall be provided as soon as possible, but not later than 180 days after **September 16, 1993.** the effective date of these rules.
- (2) All of the requirements of these rules that apply to the construction industry shall commence on the effective date of these rules, except as follows:
- (a) Except for small businesses that have 19 or fewer employees, initial monitoring that is required by the provisions of R 325.51855 shall be completed as soon as possible, but not later than 60 days after the effective date of these rules. For small businesses, initial monitoring shall be completed as soon as possible, but not later than 120 days after the effective date of these rules.
- (b) Except for small businesses that have 19 or fewer employees, an employer shall comply with the PEL established pursuant to the provisions of R 325.51853 as soon as possible, but not later than 90 days after the effective date of these rules. For small businesses, an employer shall comply with the PEL as soon as possible, but not later than 150 days after the effective date of these rules.
- (c) Except for small businesses that have 19 or fewer employees, regulated areas that are required by the provisions of R 325.51857 shall be established as soon as possible after the results of exposure monitoring are known, but not later than 90 days after the effective date of these rules. For small businesses, regulated areas shall be set up as soon as possible after the results of exposure monitoring are known, but not later than 150 days after the effective date of these rules.
- (d) Except for small businesses that have 19 or fewer employees, respiratory protection that is required by the provisions of R 325.51862 and R 325.51863 shall be provided as soon as possible, but not later than 90 days after the effective date of these rules. For small businesses, respiratory protection shall be provided as soon as possible, but not later than 150 days after the effective date of these rules.
- (e) Except for small businesses that have 19 or fewer employees, written compliance programs that are required by the provisions of R 325.51861(1) shall be completed and available as soon as possible, but not later than 90 days after the effective date of these rules. For small businesses, written compliance programs shall be completed and available as soon as possible, but not later than 180 days after the effective date of these rules.
- (f) Except for small businesses that have 19 or fewer employees, the engineering controls that are required by the provisions of R 325.51859(1) to (4) shall be implemented as soon as possible, but not later than 120 days after the effective date of these rules. For small businesses, the engineering controls shall be implemented as soon as possible, but not later than 240 days after the effective date of these rules. Work practice controls shall be implemented as soon as possible. Work practice controls that are directly related to engineering controls to be implemented shall be implemented as soon as possible after the engineering controls are implemented.
- (g) Except for small businesses that have 19 or fewer employees, hand-washing facilities, showers, change rooms, and eating facilities that are required by the provisions of R 325.51866, whether permanent or temporary, shall be provided as soon as possible, but not later than 60 days after the effective date of these rules. For small businesses, hand-washing facilities, showers, change rooms, and eating facilities, whether permanent or temporary, shall be provided as soon as possible, but not later than 120 days after the effective date of these rules.
- (h) Except for small businesses that have 19 or fewer employees, employee information and training that is required by the provisions of R 325.51880 shall be provided as soon as possible, but not later than 90 days after the effective date of these rules. For small businesses, employee information and training shall be provided as soon as possible, but not later than 180 days after the effective date of these rules.
- (i) Except for small businesses that have 19 or fewer employees, initial medical examinations that are required by the provisions of R 325.51869 shall be provided as soon as possible, but not later than 90 days after the effective date of these rules. For small businesses, initial medical examinations shall be provided as soon as possible, but not later than 180 days after the effective date of these rules.

-Rule 35. Appendices A, B, D, E, and F to these rules are informational only and are not intended to create any additional obligations or requirements not otherwise imposed or to detract from any established obligations and requirements.

R 325.51886 Rescinded. Availability of rules and appendices; permission to copy

Rule 36. (1) Copies of these rules and appendices are available at no cost from the Michigan Department of Consumer and Industry Services, Standards Division, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan 48909.

(2) Permission to copy any of these documents in full is granted by the director.